DOCUMENT RESUME

ED 108 078 CG 009 897

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TITLE The Quality of Experimental Methodology in Counseling and Counselor Education.
PUB DATE Apr 75
NOTE 17p.; Paper presented at the Annual Meeting of the American Educational Research Association (Washington, D. C., March 30-April 3, 1957)

EDRS PRICE MF-$0.76 HC-$1.58 PLUS POSTAGE
DESCRIPTORS *Counseling; *Counselor Training; Educational Research; *Evaluation Methods; Literature Reviews; *Research Methodology; Research Projects; *Research Reviews (Publications); Speeches
IDENTIFIERS EIEM; *Evaluation Instrument For Experimental Methodology

ABSTRACT

The purpose of this study was to estimate, empirically, the quality of published experimental research in the fields of counseling and counselor education and to determine whether there has been an improvement over time of that quality. The sample of 152 studies was randomly chosen from the experimental studies published from 1962 through 1973 in the three major counseling and counselor education journals. Assessment of the reporting and methodology of the studies was done using the Evaluation Instrument Methodology (EIEM). Results showed that the quality of reporting was quite adequate in the sample studies, while the quality of experimental methodology was barely mediocre. Despite the trend of increasing quality, the author warns that the research in these fields must be viewed critically. The comment that poorly formulated research is not only worthless but deceptive should be heeded by counseling researchers, editors, and research consumers in an effort to upgrade the profession's research, protect future clients and trainees, and promote better counseling, service and training. (Author/PC)

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# The Quality of Experimental Methodology in Counseling and Counselor Education

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American Educational Research Association
Annual Meeting
Washington, D.C.
April 1975

CG009897

# The Quality of Experimental Methodology in Counseling and Counselor Education

> The aim of science above all else is to discover new and useful information in the form of verifiable data, that is, of data obtained under conditions such that other qualified people can make similar observations and obtain the same results. This calls for orderliness and precision in uncovering relationships and communicating them to others. (Hilgard, 1962, p.9)

Counseling psychology is usually considered an applied science, and presumably the aim of science as stated above is also a goal for this branch of psychology. Some counseling psychologists (Hansen & Warner, 1971; Thoresen, 1969; Whiteley, 1967) have questioned whether the profession is making significant progress toward this goal. An often read criticism is that the overall quality of research is questionable. Members of the profession (Pawlicki, 1970; Schmidt & Pepinsky, 1965; Thoresen, 1969) have specified the need for a conserted effort toward the improvement of the quality of the profession's research.

There are obvious reasons which require that the concern for quality research be carefully considered. One is that the profession may risk building a research base on a foundation of sand. With the reticence of most professionals to replicate studies, the findings of published research are not often substantiated by empirical methods. Consequently, research based on prior findings and on the assumption that published research is established fact may perpetuate questionable conclusions. A second reason for the concern for quality research is the waste of professional time and effort invested in research with poor methodology. The progress of counseling to establish a research base will be inhibited by design and methodological errors. "Research which is not well formulated is more than worthless since it becomes deceptive as well (Whiteley, 1967, p. 281)."

While there is consensus of the literature that a lack of well-planned and executed research in counseling exists, the authors of such conclusions base their comments on varying types of data. Some communicate intuitive estimations

of the state of counseling research (Coleman, 1957; Fisher & Roth, 1961), while others conclude from estimations following a systematic review of the literature on various topics (Gazda & Larsen, 1968; Hansen & Warner, 1971; Pawlicki, 1970; Schmidt & Pepinsky, 1965). Though several authors have surveyed counseling journals to describe such variables as statistics used in data analysis and institutional affiliation of authors, there has been only one published study to date which has attempted to estimate the quality of research methodology by empirical means. Kelley, Smits, Leventhal, and Rhodes (1970) systematically evaluated the designs of all empirical studies published in the Journal of Counseling Psychology from 1964 through 1968. Using Campbell and Stanley's (1963) criteria, they concluded that this group of studies "has little relevance beyond that of generating testable hypotheses (p. 340)." The majority of studies had sources of invalidity not controlled in their designs. This evaluation, however, scrutinized only one aspect of research methodology, that of design.

The purpose of the present study was to empirically estimate the quality of published experimental research in the fields of counseling and counselor education and to determine whether there has been an improvement over time of that quality. Specifically, the intent of the investigator was to systematically evaluate the methodology of experimental research which has been published from 1962 through 1973 in counseling and counselor education journals. This investigator recognizes that the study has examined only one of the two issues of quality of research. The research methodology has been evaluated, while relevance of the results and studied phenomena to the profession has not been examined. While neither is a sufficient condition, both are necessary conditions for quality research in a profession.

## Method

### Sample

The sample of 152 studies was randomly chosen from the experimental studies

published from 1962 through 1973 in the three major counseling and counselor education journals: Journal of Counseling Psychology, Personnel and Guidance Journal, and Counselor Education and Supervision. The three journals were chosen as the major publication outlets for experimental studies for counselor researchers and educators. Thirty-eight studies were randomly chosen from each of these year spans: 1962-1964, 1965-1967, 1968-1970, 1971-1973. The total sample size represented 41 percent of the population.

## Design

The independent variable of interest was years of published research in counseling and counselor education. The total time span of 1962 through 1973 was considered. This was divided into four levels, each level containing three years: 1962-1964; 1965-1967; 1968-1970; 1971-1973. Thus, the design of this correlational study is a 1 x 4 matrix with an equal number of observations per cell:

Years

| $y_1$ | $y_2$ | $y_3$ | $y_4$ |
|---|---|---|---|
| $n_1=38$ | $n_2=38$ | $n_3=38$ | $n_4=38$ |

$y_1$ = 1962 - 1964

$y_2$ = 1965 - 1967

$y_3$ = 1968 - 1970

$y_4$ = 1971 - 1973

The hypotheses tested were:

1. There is a significant linear trend for the dependent measures across the four year spans.

2. There is a significant quadratic trend for the dependent measures across the four year spans.

3. There is a significant residual trend for the dependent measures across the four year spans.

## Instrument

Assessment of the reporting and methodology of the studies was done using the Evaluation Instrument for Experimental Methodology (EIEM), a rating form

developed by the investigator. The instrument was constructed by a compilation of the recurring problems in experimental counseling research cited in the professional literature. Special attention was also given to published guides for the evaluation of research. Experts in research methodology were consulted during the initial and trial stages of instrument development.

The EIEM has 37 Likert-scaled items, each item having six response options. The six responses were consistent across items (see Figure 3 ). Six scores were derived from the EIEM: reporting, introduction, methods, results, discussion and total. Concurrent validity of the instrument was estimated to be .85, and the interrater reliability estimate prior to data collection was .79 using Hoyt's Analysis of Variance. During the data collection the average interrater reliability coefficient was .78.

Procedures

Fifteen of the total of 152 studies were randomly chosen to be independently rated by all of the raters in order to establish interrater reliability estimates. The remaining 137 were randomly ordered and then assigned to the three raters. The fifteen studies designated for reliability checks were evenly placed throughout the sequence of the other studies for each rater. The random sequence of the studies was intended to avoid a time or fatigue bias, and the random assignment to rater was done to avoid a rater bias. Prior to the rating process each study was photocopied and blinded for journal name, author's name and affiliation, and dates.

Three doctoral students, recognized as having expertise in research methodology and statistics, were paid to rate the studies. They were trained in the use of the EIEM immediately prior to the rating process. During the two week process each rater work independently. Interrater reliability checks were made at fifteen points throughout the process to establish that a reliability of at least .70 was maintained. This goal was accomplished.

## Results

Mean scores and standard deviations for the four groups on the five subscales and one total score on the EIEM are shown in Table 1. The standard deviations reported are those used in the data analysis following a correction for having a finite population.

Table 1. Mean Scores and Corrected Standard Deviations for the Scales of the EIEM

| | Y 1 | | Y 2 | | Y 3 | | Y 4 | |
|---|---|---|---|---|---|---|---|---|
| | Mean | S.D. | Mean | S.D. | Mean | S.D. | Mean | S.D. |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Reporting | 4.53 | .74 | 4.73 | .65 | 4.63 | .60 | 4.90 | .57 |
| Introduction | 4.42 | .84 | 4.73 | .80 | 4.67 | .75 | 4.90 | .60 |
| Method | 3.19 | .86 | 3.56 | 1.00 | 3.56 | .85 | 3.77 | 1.06 |
| Results | 3.31 | .95 | 3.71 | .90 | 3.52 | 1.01 | 3.84 | .91 |
| Discussion | 3.33 | 1.19 | 3.62 | 1.02 | 3.36 | 1.10 | 3.70 | .92 |
| Total | 3.76 | .70 | 4.09 | .69 | 3.94 | .65 | 4.22 | .65 |

A multivariate analysis of orthogonal polynomials was accomplished to determine the form of the relationship between the year spans for the six dependent variables. The purpose of this analysis, commonly called a trend analysis, was to determine whether the means of the dependent variables were influenced by change in the independent variable, time or years. The results of the analysis are found in Table 2.

Table 2. Multivariate Test for Orthogonal Polynomials for Six Scales of EIEM

| Test | F-ratio | df | p |
|---|---|---|---|
| Linear | 2.135 | 1,148 | $<.05$ |
| Quadratic | .320 | 1,148 | $<.93$ |
| Residual | 1.043 | 1,148 | $<.40$ |

A significant linear relationship with a nonzero slope was found to exist across time. After graphing the observed and estimated means for each dependent measure (Figures 1 and 2), a slightly positive significant linear trend was evident. Therefore, the quality of methodology in counseling and counselor education has improved over the twelve years. However, the degree of increase is slight. The estimated slopes, each defined as the increase in the mean of the dependent variable from one year span to the next, vary from .08 to .17 on the 1 - 6 scale used for the EIEM.

Although prediction into time should be made with caution, the trend based on experimental research published from 1962 through 1973, if maintained at the same rate, will predict a mean rating for the total score for quality of methodology and reporting of 4.46 by 1974, 4.94 by 1991, and 5.30 by 2000. By 1994 the mean will indicate that in an overall evaluation experimental research in counseling and counselor education has become clearly adequate.

Univariate and multivariate confidence intervals were generated around the estimated means of the dependent variables to

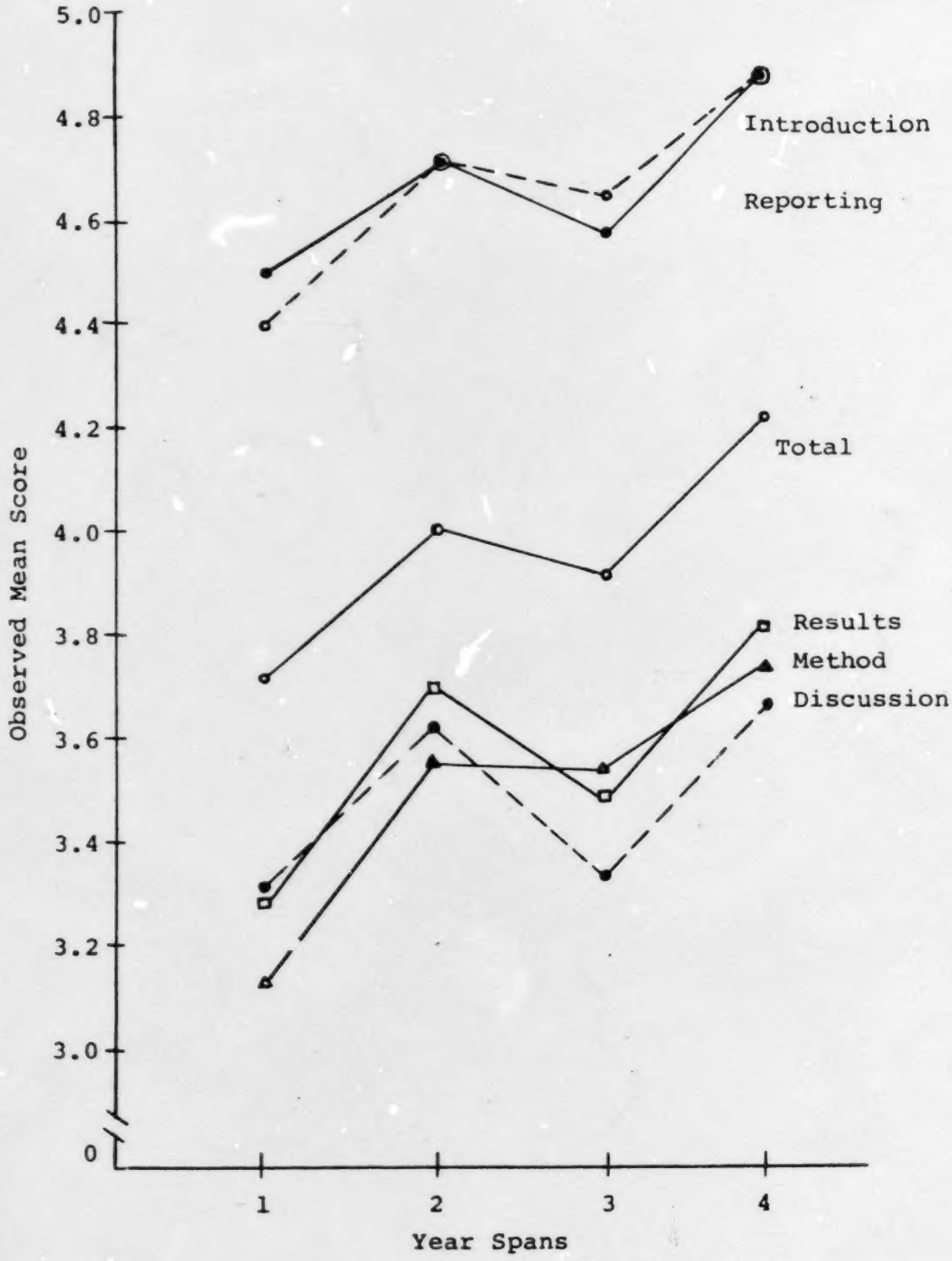


Fig. 1. Observed Means on the Six Measures of the EIEM.

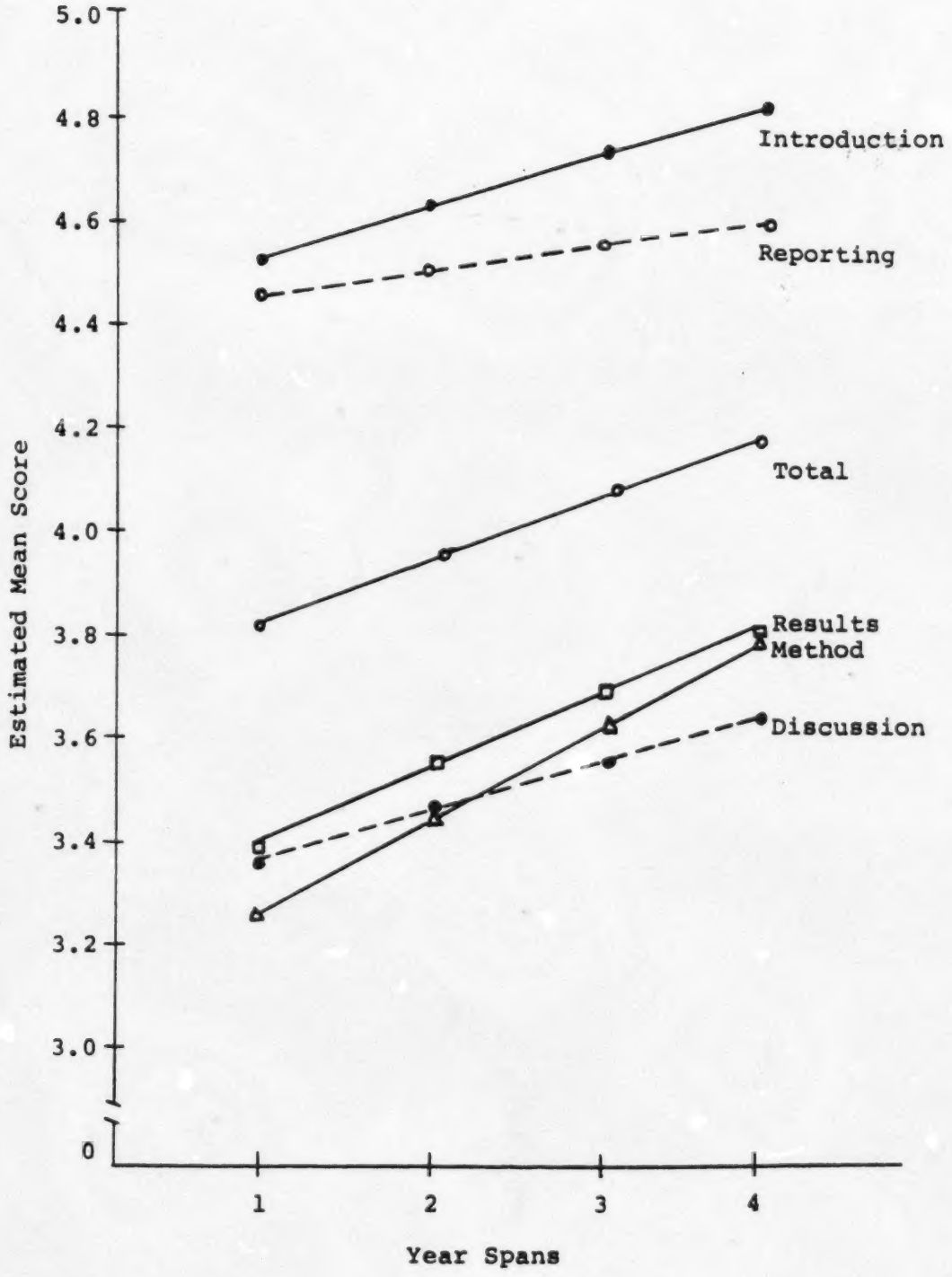


Fig. 2. Estimated Means on the Six Measures of the EIEM.

consider the present state of experimental research in the profession. For this evaluation only the most recent year span, 1971 to 1973, was considered. Figure 3 contains the graphic representation of the univariate intervals compared to the scale of the dependent measures derived from the EIE'. Two subscales, reporting and introduction, are clearly on the adequate end of the scale, while the three other subscales, method, results, and discussion, span the middle area of the scale. The quality of the reporting and the introduction section was "clearly adequate" for the last year span. However, the measures which evaluated the essence of the experimental research were considerably lower. These aspects of the evaluated research studies were in the gray area, neither "clearly inadequate" nor "clearly adequate." The interval for the total score was predictably between the two groupings and could be characterized as "barely adequate."

## Discussion

The results of the evaluation of experimental studies in couseling and counselor education support both positive and negative speculations of the quality of the profession's research. The results indicate that there were differences between the year spans in the form of an increasing linear trend. This increasing linear trend is the major finding of the investigation. It indicates that the quality of methodology used in published counseling research is improving. However, the rate of improvement is minimal, and prediction over time is risky. Contributing factors to the quality of published research are complex and probably do not act uniformly over time.

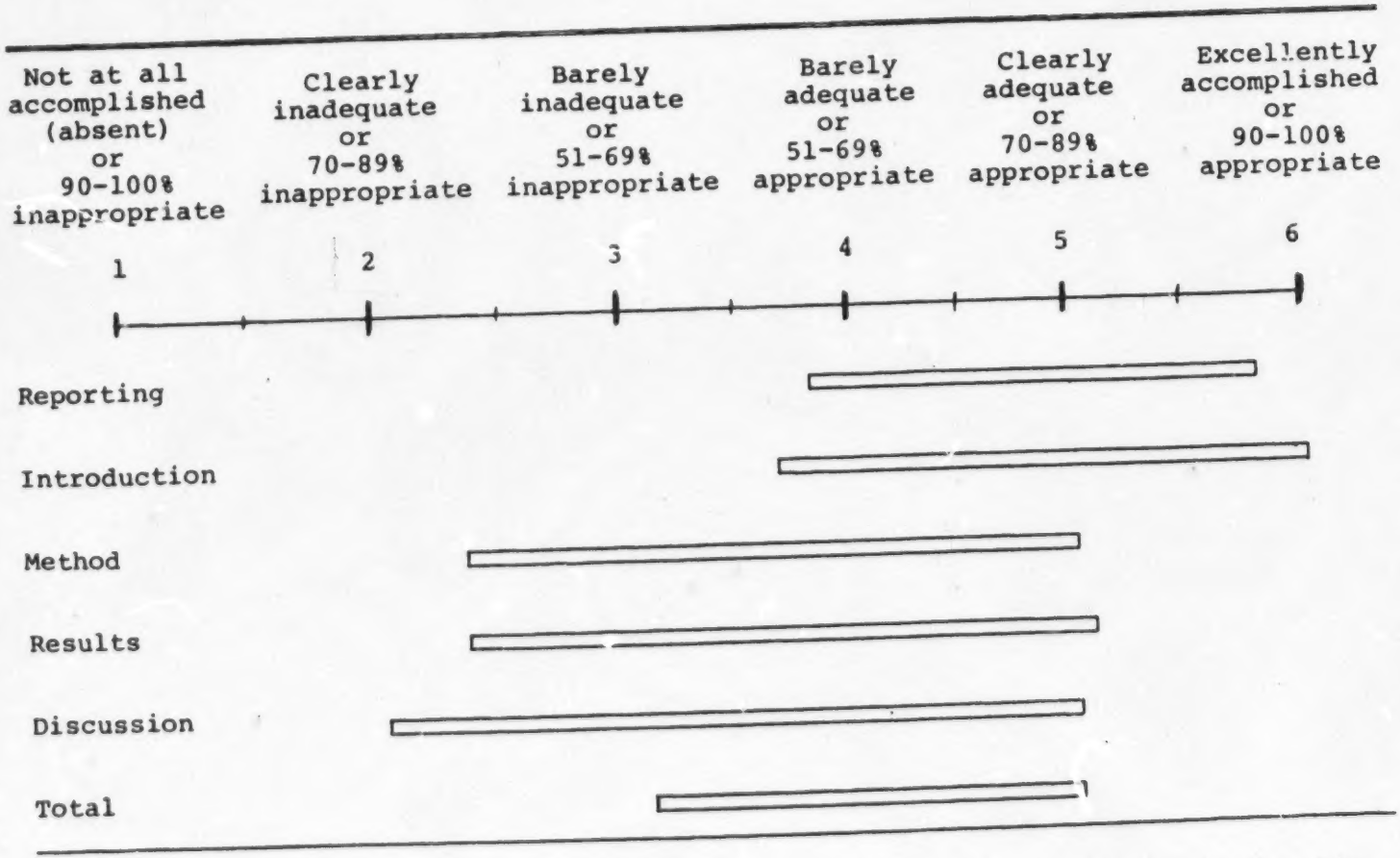


Fig. 3 . Graphic Description of Univariate Confidence Intervals for Six Scales of EIEM.

Therefore, the postulation by several counselor educators (Carkhuff, 1965; Myers, 1966; Patterson, 1963) that the quality of research in counseling and counselor education has been improving over time is supported by this empirical investigation of methodology, but with the cautions previously stated. The results of this study, however, are applicable only to the population of experimental studies of counseling and counselor education research. The conclusions of other professionals (Gazda & Larsen, 1968; Hansen & Warner, 1971; Thorensen, 1969) that there is a lack of well-planned and executed research is also supported, as demonstrated by the examination of the confidence intervals for the dependent measures for the years 1971-1973. The quality of reporting for recent experimental publications is relatively high, as evidenced by a mean of 4.89 for the overall rating of reporting and by the confidence interval for the dependent variable reporting. However, the quality of methodology was rated less than "barely adequate." The mean for the overall methodology rating was 3.87. While the quality of the reporting of an experimental project is important for replication and communication within the profession, the impact of poor quality methodology is greater. Misleading or false results, a possible consequence of poor methodology, can be costly, especially in fields that deal with human beings.

In an effort to provide feedback on specific aspects of experimental methodology, the means for individual items were examined. The low ratings of the items on random selection and discussion items are particularly significant. It is probable that many readers, especially those with inadequate knowledge of

research methodology, look to the discussion section for conclusions without careful consideration of the previous sections of the experimental report. Thus, considering the rated inadequacy of generalization statements, too many researchers are misrepresenting the applicability of their results, and too many consumers may not be perceiving the illegitimate generalizations. Such occurrences are potentially harmful to the profession, and thus, also to those who are served. The continued growth of counseling research is also hampered by such practices.

This study's reults can be used in several ways: as a baseline of the status of published counseling research at a given point in time: as an attentional device directed at the need for more carefully executed research; as an educational tool for those who read and evaluate professional research; as an educational tool for those who teach research skills for improvement and/or reemphasis of course content; and as feedback to editors of journals for improvement in review and acceptance criteria.

Implications from the results of this study are relevant to all counselors and counselor educators, whether they are researchers, practitioners, editors, or educators, as well as consumers of published research. Recommendations to researchers on the specific aspects of reports which contribute to questionable and deceptive experimental results have been made elsewhere (Ripstra, 1974). An additional suggestion derived from the results is that researchers as well as editors should consider the

replication of previous research as valuable professional effort. Replication is a necessary contributor to the development of a reliable research base for a profession, but unfortunately it has not been a type of research that results in reinforcement for the researcher. Replication would be one method of increasing the pace of improvement of the quality of counseling research.

The implication for educators is to consider that counselors should be trained to be competent readers and evaluators of research. A counselor training program should include a research methodology unit which would teach the trainee to discriminate quality of methodology. For those educators who teach research skills the specific results of the items of the EIEM pinpoint the areas of methodology which contribute to the less-than-adequate evaluation of current counseling research (see Ripstra, 1974). The EIEM or some similar instrument could be used as a learning tool for the trainee.

The recommendation for the practitioner and consumer of counseling research is to carefully consider all aspects of a research report. The results of the evaluation of experimental studies showed that the methods, results, and discussion sections of a report have the highest probabilities for error or misleading statements. These sections also have the largest impact on the significance of the results of an experimental study. Careful reading of published studies is therefore imperative. The reader's assumption that a study which has been published in a professional journal has quality methodology and states legitimate results and conclusions is not entirely justified.

In conclusion, the systematic evaluation of methodology and reporting of research in counseling and counselor education revealed mixed results. The quality of reporting was quite adequate, while the quality of experimental methodology was barely mediocre. Despite the trend of increasing quality, the research in these fields must be viewed critically. Whiteley's (1967) comment that poorly formulated research is not only worthless but deceptive should be heeded by counseling researchers, editors, and research consumers in an effort to upgrade the profession's research, protect future clients and trainees, and promote better counseling, service and training.

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